

REMARKS

Claims 1 through 29 are in this application and are presented for consideration. Claims 22 through 29 have been added.

The claims have been amended to place the application in better form, and to further highlight and more clearly point out the important features of the invention.

Claims 1 through 7 and 19 through 21 have been rejected as being obvious over Ersoy '480 in view of Nishino '629.

The rejection states that it would have been obvious to modify the joint ball of Ersoy to have the plastic ring as taught by Nishino for embedding the magnet therein. However this statement by itself does not provide any indication why embedding a magnet in a plastic ring would be beneficial in Ersoy. The rejection then further states that this also allows for pieces of the structure to be produced independently from each other and then secured together without directly securing the magnet to the joint ball. The rejection appears to state that this is an additional benefit. However it appears that this is the only benefit indicated in the rejection.

Applicant finds no reason in the prior art why producing the pieces of the structure independently from each other is, by itself, beneficial in Ersoy, or why then securing them together without directly securing the magnet to the joint ball is beneficial in Ersoy. Applicant finds no reason why a person of ordinary skill in the art would be led to this modification. The proposed combination in the rejection adds an additional piece, the plastic ring, into Ersoy. This makes the proposed combination more complicated. The fact that this plastic ring can be

produced independently does not appear to outweigh the disadvantage of making Ersoy more complicated. It is applicant's position that, by itself, producing the plastic ring independently provides no benefit at all to a person of ordinary skill.

The second part of this rejection appears to indicate that there is a benefit to securing the magnet to a joint ball, without directly securing the magnet to the joint ball. The rejection does not indicate why an indirect connection of a magnet to a joint ball is beneficial, except to say that pieces can be produced independently. Applicant notes that a magnet and a joint ball are produced independently in Ersoy, and therefore producing a plastic ring independently does not appear to provide any benefit to a person of ordinary skill. Unless there is some reason in the prior art why an indirect connection of a magnet to a joint ball is beneficial, an indirect connection is not obvious. A person of ordinary skill in the art would therefore not be led to combine the references as indicated in the rejection, since this person of ordinary skill in the art would not realize any benefit from the combination. This rejection is therefore overcome.

It is only the present applicant who recognizes how a ball joint with a magnet could be improved. In particular applicant has discovered that when the ball pivot is made from ferromagnetic material, this ferromagnetic material can adversely affect the shape of the magnetic field, substitute specification paragraphs 5, 6, and 11.

In particular, the magnetic field lines that emanate from the north and south poles of the magnet will have its field lines almost immediately turn around and pass through the ferromagnetic material of the ball joint. The magnetic field from such a magnet therefore does not emanate far from the poles, and the magnetic field that does emanate from the poles is very

quickly dissipated as it bends around the magnet toward the opposite pole.

By the present invention placing a plastic ring around the magnet, the magnetic field lines do not immediately turn around toward the opposite pole, but instead extend further outward from the exposed pole and then turn around to pass through the ferromagnetic material spaced from the magnet by the plastic. This results in a magnetic field which extends further out from the pole, and is more concentrated. Applicant has found that such a magnetic field is easier to sense by sensors mounted in the housing. This results in more accurate sensing of ball joint movement, or less expensive ball joints since less expensive magnets and sensors can be used.

Another improvement that the present applicant has discovered is with regard to the thermal expansion of the material of the ball pivot and the magnet. Different thermal expansion coefficients can cause problems when determining the size of the recess and the size of the magnet. At one specific temperature, the recess and the magnet are of the same size. However when the temperature changes, the ball pivot and magnet will change sizes at different rates. Therefore at a different temperature, the recess and the magnet will have different sizes. This can cause difficulty in mounting a magnet inside a ball pivot. It is only the present applicant who has recognized this problem in a ball joint with a magnet, and who has discovered that the use of a plastic ring around the magnet overcomes this problem.

Applicant notes that the courts have decided “[A] patentable invention may lie in the discovery of the source of a problem even though the remedy may be obvious once the source of the problem is identified. This is part of the ‘subject matter as a whole’ which should always

be considered in determining the obviousness of an invention under 35 U.S.C. § 103.” In re Spinnoble, 405 F.2d 578, 585, 160 USPQ 237, 243 (CCPA 1969). Since it is only applicant who has discovered how directly fastening a magnet to a joint ball is disadvantageous, and it is only applicant who has proposed a solution to such a problem, applicant's invention is patentable over the prior art.

Furthermore, the person of ordinary skill in the art would not combine Ersoy and Nishino since the holding part 200 according to Nishino et al. serves as a sliding member and keeps the magnet in a spaced location relative to the sliding surface 208a (support surface). As one can see from the description and the drawings of Nishino et al., the holding part 200 slides on the support portion 208. In particular, the holding part 200 has an annular flange portion 228 extending radially outward from an axial or lower end of a circumferential wall 226 of the holding part 200, wherein the annular flange portion 228 slides on the support surface 208a of the support portion 208.

In contrast to this, the nonmagnetic material according to the present invention does not serve as a sliding member. Further, Ersoy et al. refers to a ball pivot of a ball-and-socket joint for a motor vehicle, whereas Nishino et al. refers to a pointing device for e.g. electronic notebooks, personal digital assistants (PDAs) or mobile phones. Therefore the person of ordinary skill would have no reason to believe that the holding part 200 of Nishino would be beneficial in Ersoy. The independent claims therefore further define over the rejection.

New independent claim 26 sets forth that the nonmagnetic material is completely arranged within the recess. As described above, the holding part 200 in Nishino slides on the

support portion 208. This requires that the annular flange portion 228 extend out of any recess in which it is mounted. Therefore Nishino leads a person away from having a nonmagnetic material completely arranged within a recess. Claim 26 therefore further defines over the prior art.

New claims 22 and 27 set forth that the magnet projects out from a surface of the nonmagnetic material. Applicant finds no teaching nor suggestion in Nishino of a magnet projecting out from a surface of a nonmagnetic material. Claims 22 and 27 therefore further define over the prior art.

Claims 23 and 28 set forth that the nonmagnetic material is completely shaped as a hollow cylinder. Applicant notes that the holding part 200 of Nishino is not completely shaped as a hollow cylinder. Claims 23 and 28 therefore further define over the rejection.

Claims 24 and 29 set forth that a maximal outer diameter of the nonmagnetic material is equal to or less than the diameter of the recess. Since Nishino clearly sets forth that the holding part 200 is to have a flange 228, Nishino clearly leads away from a maximal outer diameter of nonmagnetic material being equal or less than a diameter of a recess. Claims 24 and 29 therefore further define over the prior art.

If the Examiner has any comments or suggestions which would further favorable prosecution of this application, the Examiner is invited to contact applicant's representative by telephone to discuss possible changes.

At this time applicant respectfully requests reconsideration of this application, and based on the above amendments and remarks, respectfully solicits allowance of this application.

Respectfully submitted
for Applicant,



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